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EXAMINER
BILDEFAL, T

01M1/0912

MICHAEL D SCHUMANN
MERCHANT GOULD SMITH EDELL WELTER
& SCHMIDT 3100 NORTHWEST CENTER
90 SOUTH SEVENTH STREET
MINNEAPOLIS MN 55402-4131

ART UNIT PAPER NUMBER

1107

DATE MAILED:

09/17/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 5/1/95 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), — days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- ☒ Notice of References Cited by Examiner, PTO-892.
- ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
- ☐ Notice of Art Cited by Applicant, PTO-1449.
- ☐ Notice of Informal Patent Application, PTO-152.
- ☐ Information on How to Effect Drawing Changes, PTO-1474.
- ☐

Part II SUMMARY OF ACTION

- ☒ Claims 1-7 are pending in the application.
Of the above, claims — are withdrawn from consideration.
- ☐ Claims — have been cancelled.
- ☐ Claims — are allowed.
- ☒ Claims 1-7 are rejected.
- ☐ Claims — are objected to.
- ☐ Claims — are subject to restriction or election requirement.
- ☐ This application has been filed with Informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
- ☐ Formal drawings are required in response to this Office action.
- ☐ The corrected or substitute drawings have been received on —. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
- ☐ The proposed additional or substitute sheet(s) of drawings, filed on —, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
- ☐ The proposed drawing correction, filed —, has been ☐ approved; ☐ disapproved (see explanation).
- ☒ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☒ been received ☐ not been received
☐ been filed in parent application, serial no. —; filed on —.
- ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
- ☐ Other

Art Unit: 1107

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as the specification as originally filed, does not provide support for the invention as is now claimed. There is no support in the specification and drawings for forming holes of substantially equal depth by removing portions of the second insulating layer to expose the first metal and conductive layers since the step which exposes the layers does not create holes of the same depth (see Figure 2C). In re claim 7, there is no support in the specification and drawings for a plurality of filled contact holes of different overall depth resulting from the second contact hole filling since as can be seen from figure 2D the holes have a similar depth.

Claims 1, 2, and 7 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

Claims 1-7 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1107

In claims 1, lines 7 and 14, and claim 3, lines 7 and 13, the use of "desired" reads on a nebulous mental step conducted prior to the manipulative steps of the claimed invention, hence rendering the present process claims unclear in meaning and scope. If applicant wishes to patent detailed controls over the recited process, they must be positively recited.

In claims 1 and 3, lines 6 and 12, "the whole structure" has no proper antecedent basis. Furthermore it is unclear which structure is being recited. Perhaps the applicant intends "the resultant structure"?

In claim 2, line 1, "methods" should be --method--.

In claim 4, lines 4 and 7, the scope of the claim is rendered unclear by the use of "associated with". In line 6, the use of "second metal" is confusing since it is unclear if the applicant intends the second metal of line 3 or a different metal layer.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

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Claims 1-7 are rejected under 35 U.S.C. § 103 as being unpatentable over the admitted prior art in view of Wolf.

The admitted prior art teaches providing a silicon substrate (10); forming a field oxide (3), junction layer (2), and gate electrode (5); forming a first insulating layer (6) over the structure; forming a patterned conductive layer (7) on the first insulating layer; forming a second insulating layer (8) over the first; forming holes in the first and second insulating film to the gate and junction followed by filling the holes with CVD tungsten (9). The admitted prior art doesn't teach filling the first holes with CVD tungsten with and planarizing the first insulating layer before forming the patterned conductor.

Wolf teaches that planarization of an inter-metal dielectric is desirable before forming subsequent metal on the dielectric (page 201-203). It would have been obvious to one of ordinary skill in the art to have planarized the first dielectric layer in the process of the admitted prior art prior to forming the patterned conductor layer for the benefits as taught by Wolf. Wolf further teaches that filling via holes of significantly varying depth is also a problem (page 204-205). Therefore it would have been obvious to one of ordinary skill in the art to have formed the first holes and have filled them just subsequent or prior to planarizing the first dielectric in the process of the admitted art to have avoided holes of significantly varying depth as taught by Wolf.

In re claim 7, alternatively if a planarizing step was not performed, it would have still been obvious to one of ordinary skill in the art to have formed the first holes and have filled

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them just subsequent to forming the first dielectric in the process of the admitted art to have avoided holes of significantly varying depth as taught by Wolf.

Applicant's arguments filed 5/1/95 have been fully considered but they are deemed to be moot in light of the new grounds of rejection.


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant may respond to this office action by facsimile transmission as per 37 CFR 1.6(d) (Also see MPEP 502.01). Applicant is directed to 58 FR 54494 (October 22, 1993) and 1156 Off. Gaz. Pat. Office 61 (November 16, 1993). Also see 37 CFR 1.4(f). The transmission should identify the serial number of the application, art unit 1107 and the name of the examiner in charge of the application as indicated below. The facsimile numbers for group 1100 are (703)305-3599 and (703)305-3600.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Thomas Bilodeau whose telephone number is (703) 308-1090.

Any inquiry of a general nature or relating to the status of the application should be directed to the Group Receptionist whose telephone number is (703) 308-0661.

TB
Tbilodeau
August 31, 1995


GEORGE FOURSON
PATENT EXAMINER
GROUP 1100